

Message

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Sent: 7/9/2018 5:52:29 PM
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CC: Linder, Steven [Linder.Steven@epa.gov]; Shalev, Omer [Shalev.Omer@epa.gov]; g.d.beckett@aquiver.com
Subject: Example Challenge with Navy Thermal Data Interpretation
Attachments: LNAPL_heat_sig.png

Hi folks,

As you know, we've been asking the Navy for their full suite of thermal monitoring data so we can do some of our own thinking & assessment. GSI interprets the base of the LNAPL zone to be ~30-ft below Tank 5 based on this data, and they discount the potential breakthrough chemistry at RHMW02 as "scatter", leaving just the single interpretation that then constrains their LNAPL box model. One of my points to the Navy has been that their interpretation of the thermal data is far from certain.

Attached is a figure I've been trying to find to help elucidate this issue. It's from "*Stockwell, E., 2015. Continuous NAPL Loss Rates Using Subsurface Temperatures. Thesis. Department of Civil and Environmental Engineering. Colorado State University.*" The figure shows the net temperature (background subtracted) in the color flood, with laser-induced fluorescence logs super-imposed. The LIF logs show the LNAPL distribution is across the full depth of the cross-section (varying by location). The temperature profile is essentially identical to the Red Hill profiles showing a sharp increase with depth to a maximum "bulge" and then decreasing thereafter, but decreasing within the LNAPL impacted zone. This is fairly common and why I've been pushing GSI on their one-answer only interpretation.

So, absent plume characterization data for the Tank 5 release, all the thermal data says is there is a biologically active zone, it does not, absent other data, prove anything one way or the other about the LNAPL distribution. Since the rock tends to get more competent with depth, one would expect biodegradation to decrease as a function of surface area, moisture and other factors in play.

Fundamentally, there is no basis at this time for an interpretation based on the thermal data. If the Navy can go elsewhere in a similar environment and show this Hawaii-specific temp profile matches other interpretations where there is adequate characterization, then perhaps that would lend some credence to their assessment. Right now it's just a non-conservative hypothesis unsupported by any secondary plume distribution data (except g.w. data may actually conflict).

Best regards